Design thinking and innovation

Design Thinking and Innovation: Synthesising Concepts of Knowledge Co-creation In Spaces of Professional Development

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ABSTRACT

This paper explores how design thinking connects to concepts of knowledge creation and innovation. A case study of a knowledge sharing network in the social services sector is used to illustrate how design thinking supports Ba, the spaces for knowledge creation. Further exploration of the four enabling conditions for Ba resulted in delineation of two distinct types: relational and structural. Relational enablers support three groups of enabling conditions: interaction, shared values and communication. It is proposed that design thinking aligns well with relational enabling conditions for Ba to create the ideal spaces for knowledge creation. The group of structural enablers can assist or obstruct change and relate to the culture and management approaches of an organisation, which may or may not be assisted by design thinking. However, to ensure that design thinking is not undermined, and innovation is achieved, the presence of an appropriate structural enabler is critical for success.

Keywords: Design Thinking, Innovation, Knowledge Co-creation, and Ba

1.0 INTRODUCTION

In recent times, interest has re-emerged in design thinking as an iterative, human-centred, co-creative approach that can support innovation in the economy and wider society. This paper explores the connection between design thinking, Ba (spaces for knowledge creation), and innovation in social services.

A brief literature review and key questions are presented in Section 2 providing background and context for this paper. In Section 3, a case study from the social services sector (Learning & Development Exchange: L&DEx) is used to present a theoretical exploration of how design thinking enables knowledge creation and innovation. Section 4 introduces the design thinking methods and stages of the L&DEx to explain the mechanisms through which Ba (spaces for knowledge creation) leads to innovation. Section 5 provides a discussion and response to the key questions. This is followed by concluding remarks in Section 6.

2.0 CONTEXT / LITERATURE REVIEW

Literature on design thinking and innovation has highlighted the importance of appreciative cooperation and collaboration between actors from different backgrounds. This paper acts as a demonstration of the benefits of such processes because it involves collaboration between authors from a school of art and a school of education who first met during the European funded CREANOVA project that analysed innovation and creativity (Davis et al. 2011).

While a comprehensive critique of design thinking is outside the scope of this paper, by exploring the constituent elements of this approach and its application and outputs within the context of innovation in the social services, we seek to better understand and articulate design thinking's role in facilitating innovation.

2.1 Design Thinking

Design thinking can be considered as a creative, human-centred, participative, exploratory and problem solving process that values different perspectives of a problem (Dunne and Martin 2006; Melles and Misic 2011; Brown 2008, 2012). Its origins have been traced back to the 1960s design methods movement, that shifted from a scientific investigative approach of 'what is', to a more

creative exploration of "what ought to be" (Simon 1969).

But what is design thinking? It is considered difficult to define: using "fuzzy terminology" (Wooden 2013) and meaning different things to different people (Hanttu 2013). Approaches to delivering design thinking also vary in terminology and phases of execution. The UK Design Council illustrates a four-stage process: discover, define, develop, and deliver termed the 'Double Diamond' (Design Council 2005); whereas innovation consultancy IDEO (Brown 2008) proposes the approach incorporates three spaces: inspiration, ideation, and implementation; and Stanford d.school (d.school 2015) identifies a five-stage process including empathise, define, ideate, prototype and test. Such issues highlight that clarity of meaning is vital, particularly to engage non-designers (Inns 2013). Drawing on years of practical experience applying design thinking, one of the authors (Docherty and MacBryde 2015) evolved three underlying principles that are core to this approach: stakeholder/user engagement; a structured co-creative process; and iterative testing and refining of outputs.

Previous research on design thinking has suggested its suitability for exploring 'wicked' and complex problems that emerge in times of disruptive, intense and rapid change (Buchanan 1992, Lockwood 2009) and recognised its ability to provide a systemised design process that enables innovative solutions to business and social issues (Martin 2009; Verganti 2009). Within a business and management context, design thinking has been identified as a mechanism that adds value, unlocks innovation and generates economic benefits (HM Treasury 2005; OECD 2013; D'Ippolito 2014; Docherty and MacBryde 2015). Design thinking is also recognised as an instrument for societal change in public services (Bason 2010; Boyer 2011; Design Commission 2013; Hallsworth and Rutter 2013).

However, design thinking is not without its critics, some commenting on a lack of a theoretical basis (Kimbell 2011; Johansson-Skoldberg et al. 2013). Kimbell (2011) called for critical appraisal relating to cultures of design: a cognitive style; a general concept; and a resource for organisational change. Further understanding of design thinking is also required within a management context (Johansson-Skoldberg et al. 2013); and in relation to 'value creation' and its impact on the organisation (D'Ippolito 2014).

Design thinking has also been accused of: producing incremental rather than disruptive innovation, "losing its meaning" and becoming a "failed experiment". On the one hand it has been critiqued because the iterative, creative process has become lost in corporate efficiency (Cross

2010; Nussbaum 2011). On the other hand, it has been accused of extending project timescales/costs, affecting motivation and placing an additional burden on staff (Carlgren et al 2014).

Counter critics suggest that such claims are "overblown" and that by addressing the tensions between the design and corporate communities and clearly defining their roles, design thinking could be a valuable resource in the innovation process (Walters 2014). Indeed, Konno (2014) suggested that while superficial application of design thinking undermines its value, it can still be a vital component in achieving human-centred, purposeful innovation.

This raises the question of how design thinking supports innovation and addresses complex issues faced by sectors in transition, such as social services. In practical terms, the design thinking approach was considered appropriate by the L&DEx development team whose aim was to develop an enhanced knowledge sharing forum that incrementally built on previous experience, rather than generated a radical output. Other potential barriers had been mitigated with time, finance and management support secured in advance of the project beginning.

2.2 Ba and Basho: Spaces for knowledge creation

The concept of Ba aims to explain how the physical, virtual and mental spaces in organisations enable knowledge creation, through an organic, non-linear process that allows the self to embrace the collective, organisational and systemic (Nonaka and Konno 1998). The four distinct stages of Ba (originating, interacting, cyber and implementing) are correlated to four conversion modes (socialisation, externalisation, communication and internalisation) of Nonaka's (1994) SECI model that enable the continual, evolving spiral and transition of knowledge from tacit to explicit. The SECI conversion modes are considered to be enhanced by Ba, which enables speedier knowledge creation, transition and innovation. Where multiple, concurrent levels of Ba are evident, this is referred to as Basho (Nonaka and Konno 1998).

The significance of Ba has been explored in a number of fields. It is recognised as supporting knowledge creation in construction management (Martin and Root 2009); learning environments in collaborative networked organisations (Eijnatten and Putnik 2005) and, with particular reference to cyber ba, the innovation ecology of science and technology parks (Dvir et al 2007). It was also used by Hitachi High Technologies to inform the design of a more dynamic workplace to enable the activation of Ba to support innovation (Konno 2012).

At a functional/operational level, previous authors have suggested that Ba is supported by four enabling conditions: social/behavioural, cognitive/epistemological, information systems/management and strategy/structure (Drummond de Alvarenga Neto and Choo 2010).

Similarities between Ba and design thinking are apparent: they are both iterative processes that involve multiple stakeholders, facilitate creative exchange and enable innovation. This prompted the authors to question how different aspects of Ba and its associated enabling conditions are connected to the design thinking process.

2.3 Innovation and Creativity

There is a tension between authors who believe that knowledge creation stems from individual ability, thinking or motivation (Piirto 2004, Adams 2005) and those that argue that creativity involves an interaction between a person's thoughts and social contexts (Csikszentmihalyi 1996; Tuomi 2002). Respondents in recent research defined creativity as the individual and/or collective moment of producing new ideas or solutions and innovation as the implementation of such ideas (Davis et. al 2011). It is argued that creative ideas only have meaning if they enable alternatives to and/or adaptations of existing products and processes (Mulgan 2006; Ibáñez et al. 2010; Murty et al. 2010). In this sense, innovation differs from creativity because it involves the successful implementation of creativity in relation to new: products, services, experiences, economic enhancements and/or social benefits. (Davis et al. 2011; Ibáñez et al. 2010).

Social cohesion, common goals, and shared values are thought to support processes of knowledge creation (Davis et al. 2011). Yet, creative individuals are believed to also value interacting with people from different countries, organisations, sectors and backgrounds, particularly when joint problem solving (Davis et al. 2011). Writers have argued that one of the ideal conditions for knowledge creation is personal freedom (Sternberg 2007; Cropley and Cropley 2009). Creativity and innovation are believed to be enhanced by choice, personal initiative, and flat management structures and are inhibited by rigid rules, poorly designed work spaces, intransigent regulations, unrealistic goals, managerialist practices, top down performance indicators and technocratic approaches (Davis et al. 2011).

The stimulus for creativity and innovation can be intrinsic rather than extrinsic (Davis et al. 2011; Farrier et al. 2011). Creativity may be stimulated by external pressures such as: recessions, changes in government or local consumption shifts (Ibáñez et al. 2010; Sternberg 2007). It can

also be related to internal organisational factors such as fair distribution of opportunities, inclusive design of spaces and collaborative learning activities. When seeking to promote creativity and innovation, organisations may need to balance the requirement for personal freedom with the need for supportive organisational frameworks (Davis et al. 2011; Farrier et al. 2011).

Reflecting on these points, this paper seeks to explore a final question: What type of organisational structures best support design thinking to facilitate collective creativity, and enable a diversity of opinions to generate meaningful outputs?

2.4 Co-Creation and Social Services

Co-creative approaches such as design thinking have also been connected to the need for social services to promote participatory approaches to professional development (Ford and Lawler 2007; Lawler and Bilson 2010). Traditional managerialist approaches inhibit professionals from questioning established practices and finding solutions to complex issues (Moss and Petrie 2002; Munroe 2011), yet many managers in public services feel pressured (e.g. by inspection processes) to lead with vision, set standards and apply targets. Alternatively, supportive environments, organisational openness/flexibility, creative/interactive conflict resolution, inter-disciplinarity and freedom/choices are more stimulating organisational attributes than rigid top down technocratic rules/approaches (Sternberg 2007; Cropley and Cropley 2009).

Social service improvements can be gained by participatory and community based coordination, direction setting, collaboration, and evaluation (Lawler and Bilson 2010) and by analysis of ideology (values and conflicting approaches), politics (decision-making and power) and economic realities (resources and indicators) (Frost 2005).

This paper considers how design thinking enables co-creative approaches as an alternative to hierarchical top-down command and control structures in social services (Seddon 2008; Lawler and Bilson 2010).

3.0 RESEARCH METHODS

This paper has two layers to its methodology: firstly, the action research approach employed in delivering the L&DEx project and, secondly, a case study of the design thinking process as it

relates to the stages of innovation resulting in the L&DEx.

3.1 L&DEx Action Research Approach

In March 2011 The Design Innovation Studio at the Glasgow School of Art (GSA) entered into a partnership with the Scottish Social Services Council (SSSC) to develop an engagement process: 'Re-Imagining workforce development and planning for social services', to explore innovative approaches to workforce development and planning in social services in Scotland (Docherty, 2011).

The L&DEx project utilised design thinking in change-oriented action research, the constituent elements of which: planning, acting, observing and reflecting, are well suited to design research (Swan 2002; Foth and Axup 2006; Reason and Bradbury 2007). The three design thinking principles employed in L&DEx included: multi-disciplinary stakeholder engagement; structured co-creation process encompassing divergent and convergent thinking; and prototyping (iterative testing and refining of options). The project comprised three stages:

> Stage 1: Identification of 15 research themes, informed through interviews with nine key stakeholders in the sector, to explore in Stage 2.
>
> Stage 2: Multi-disciplinary stakeholder engagement included a Reference Group of 12 stakeholders to guide the project; contributions from 68 stakeholders (employers, education/training providers, government, public sector, private sector, voluntary sector, service users and carers) in eight participative workshops across Scotland; and a workshop with 16 staff from the SSSC workforce development team.
>
> Stage3: Development and delivery of three innovative pilot projects: 'Developing Leadership in Early Years', 'Workforce Planning', and a 'Peer Support Network'.

This paper discusses the third pilot project of Stage 3, the founding of the L&DEx in the Ayrshire, Dumfries and Galloway region of Scotland. The L&DEx sought to build on a recently disbanded local professional development forum, the Learning Network, founded in 2007. The need for a new, sustainable forum structure came from internal drivers within the sector to refocus the network to support enhanced service provision. Externally created pressure, due to cessation of funding from the Scottish Government, prompted members who possessed a genuine wish to continue the forum to accept the SSSC's offer for the GSA to facilitate the change process.

The design thinking process for the L&DEx comprised four co-creation sessions over three of the four project phases. The research phases, and associated methods employed, objectives and outputs are summarised in the table below.

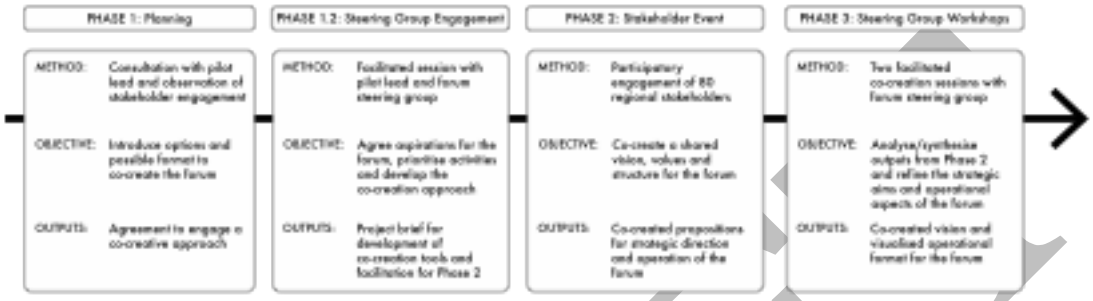

Table 1: Research Process for L&DEx

The L&DEx aims, phases and outputs provided a suitable case study to explore how and where design thinking links to innovation.

3.2 L&DEx as a Case Study

Case study research is appropriate where there is "the desire to understand complex social phenomena" (Yin 2014, p4). It is argued that by focusing on a concrete case writers can develop a thorough representation of a range of concepts (Eisenhardt 2002). This paper identifies the L&DEx as a suitable case for analysis that allows a deeper theoretical understanding of the role (how and why) of design thinking (phenomenon) in the co-creation of innovation in social services (context).

Writing on research methods problematises how we define 'the case' (Gomm 2004; Creswell 1998; Yin 2014). The case can be an empirical, context-dependent, concrete unit (people or an organisation); a context (a specific learning process); and/or a theoretical abstraction (an explanation of phenomena) (De Vaus 2001; Yin 2014). In this case the L&DEx is a social unit, a specific social services learning context and a theoretical abstraction that is employed to explain how design thinking supports the co-creation and implementation of new ideas.

We judge the utility of our case study on the basis of the theoretical advancement it can provide (Bechhofer and Paterson 2000; Yin 2014). In recognition of the inexact nature of the case and the dangers of universalisation (Riessman 2008), we used a process of constant comparison of the learning from the case study with our experience of previous research to produce complex analysis (Rapley 2007). Our approach was subjective, it stemmed from analysis of themes we were already interest in, but rigorous, in the sense that we were involved in constant comparative dialogue concerning the meaning of the case study. Yet, because we employed a single case study of a design thinking approach within a specific context, any widespread generalisation of the findings is limited and the aim of the paper is to act as a stimulus for further research on the topic.

4. FINDINGS: ALIGNMENT OF DESIGN THINKING, BA AND BASHO

The distinct design thinking phases and outputs of the L&DEx case study can be directly related to the concept of Ba, as outlined below.

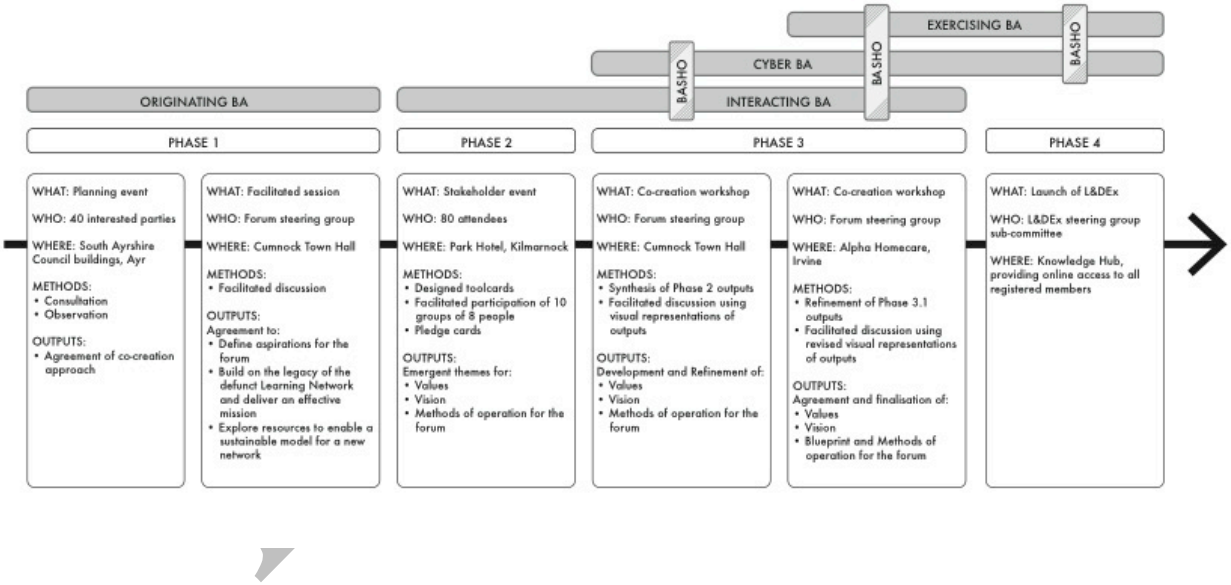

Figure 1: Phases of L&DEx Project and Associated Elements of Ba and Basho

4.1 Phase 1: Originating Ba

During Phase 1, an initial planning, consultation and local engagement event was followed by a meeting with the appointed steering group to discuss how a co-creative approach could help shape

the forum. Through open dialogue, the underlying principles of the forum were defined, a common aim identified, and a shared vision agreed: to meet member expectations, build on the obsolete Learning Network, overcome resources limitations and produce a sustainable structure. Phase 1 is an example of originating Ba and the socialisation stage of the SECI model: spaces of tacit knowledge sharing and creation enabled by face-to-face interaction (Nonaka and Konno 1998).

During this phase, it was agreed that facilitated stakeholder participation would enhance the development of the forum's vision, values, structure and operational model.

4.2 Phase 2: Interacting Ba

The forum was launched during the Phase 2 Stakeholder Engagement Event involving 80 multi-professionals. To enable a participative and inclusive approach, contributors were divided into 10 smaller groups of eight people. A participative process involving co-creation tools (see Figure 2) explored and articulated the values, focus, function and priorities of the forum. Participants were asked to complete a 'pledge' document stating the contribution that they and/or their organisation could bring to the forum. This is an incidence of interacting Ba, where a place is provided for groups to engage jointly in knowledge creation, curate contributions, make tacit knowledge explicit, refine issues, jointly create meaning and explore possibilities. This can be related to the externalisation phase of the SECI model.

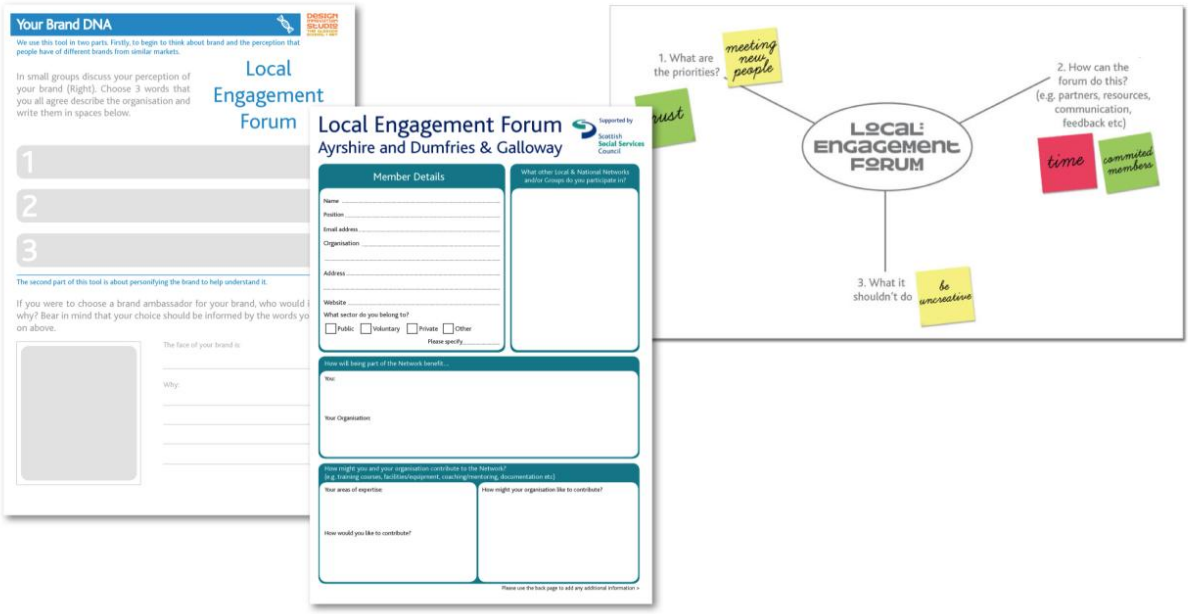

Figure 2: Example of Toolcards for Phase 2

The outputs generated emergent themes for the values and focus of the forum as well as opportunities for member engagement.

4.3 Phase 3: Basho: Interacting, Cyber and Exercising Ba

Phase 3 comprised two facilitated co-creation meetings with the forum steering group to analyse, synthesise and build on members' contributions from the Stakeholder Event and to draft the values, function and operational structure of the network. The first set of co-creative activities enabled both interacting Ba (through facilitated discussion on emergent themes) and cyber Ba (virtual spaces for knowledge creation including use of email, databases and online interactive portals). Cyber Ba is connected to the combination stage of the SECI model. Where multiple types of Ba occur concurrently (as illustrated in Figure 1) this can be called Basho or connected Ba. The second set of activities involved the finalisation of the name, values, structure, roles and functions of the network and enabled exercising Ba, related to the internalisation phase in the SECI model, where explicit knowledge is converted to tacit knowledge through its application in real or simulated situations.

The name of the forum, the L&DEx, and three core values were agreed: 'Equality', 'Two-way sharing', and 'Leading', which informed the mission statement. The agreed purpose of the L&DEx was to provide a local platform for connectivity and exchange across the social services and related sectors (e.g. health and education). It was envisaged as an evolving, membership-driven organisation with a strong focus on equality, mutuality, dispersed leadership and diverse sectoral representation, guided by a steering group and ad hoc thematic groups (illustrated in Figure 3).

The Knowledge Hub online portal, (cyber Ba), set up to support knowledge exchange among UK local government agencies, was considered the appropriate virtual communication channel for the L&DEx. The steering group's function was to provide direction for activities put forward by members via the online portal and thematic groups; and to be a conduit between grassroots social services provision in the region and the national agendas of the SSSC and other partner services.

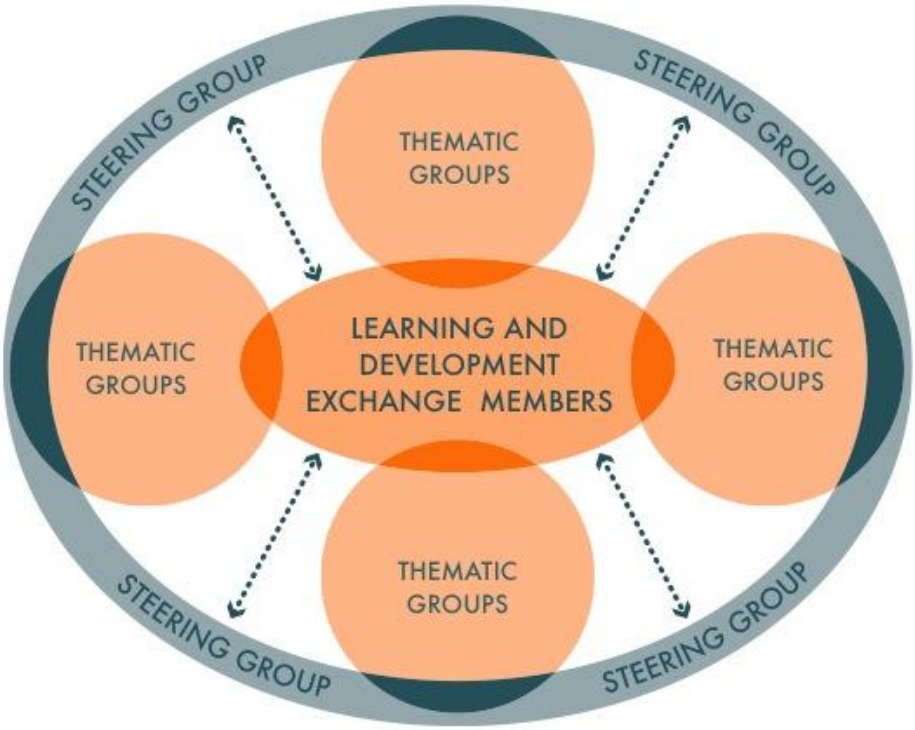

Figure 3: Illustration of the Structure of L&DEx

4.4 Phase 4: Basho: Cyber and Exercising Ba

During Phase 4, the L&DEx launched on the Knowledge Hub providing members with access to training, examples of best practice and information on workforce development issues and opportunities. This phase demonstrated cyber Ba, exercising Ba, and Basho.

The design thinking methods and techniques utilised during the L&DEx project phases nurtured co-creative spaces, engaged multi-professional members, and facilitated face-to-face and online interaction and enabled mental, physical and virtual Ba leading to the delivery of a new online resource. It should be noted that, at the time of this intervention, the full extent of exercising Ba was yet to be realised by the L&DEx members and, therefore, we concluded that aspects of exercising Ba evolve over time.

5.0 DISCUSSION: DESIGN THINKING, BA AND ENABLING CONDITIONS

This section considers how design thinking in the L&DEx project relates to the associated enabling conditions (Drummond de Alvarenga Neto and Choo, 2010) for Ba. It proposes that enabling conditions can be considered to be relational (that is, comprising activities that impact on the behaviours, format and content of interaction) or structural (referring to the underpinning organisational framework and operational culture). This differentiation is considered important as without an appropriate structural enabler, design thinking approaches could be tokenistic, the implementation of co-created ideas may be obstructed and, therefore, the opportunity for innovation can be lost.

5.1 Design Thinking as Relational Enabler

Three of the four groups of enabling conditions identified by Drummond de Alvarenga Neto and Choo (2010) can be considered as relational enablers: social/behavioural, cognitive/epistemic and informational. These three types of interaction are explored below in relation to design thinking, factors for innovation and social services.

5.1.1 Design Thinking as a Social/Behavioural Enabling Condition for Ba

Design thinking provides a heuristic framework that supports participants dealing with complex issues to collaborate on solutions generation (Martin 2009; Tschimmel 2012). The key social/behavioural enabling conditions for knowledge creation and sharing have been identified as: mutual trust, empathy, reserving judgement, encouragement, active participation, freedom, interaction and evolving relationships (Drummond de Alvarenga Neto and Choo 2010). Elements of design thinking in the L&DEx included: the active engagement of multi- professional members; the design of creative tools to stimulate discussion and generate new ideas (enabling divergent and convergent thinking, assisted through brainstorming, visualisation, synthesis and idea generation); and facilitated participatory events. These approaches were employed to actively engage participants, guide interactions and enable individuals the freedom to draw on intuitive and analytical thinking.

Participants stated that the group work was well organised, relevant, and helpful: “Workshops – were really relevant and informative,” Participant_A18; “Very good format,” Participant_B14 (Docherty and Dowling 2012). They also suggested that further involvement of the facilitation

team and international perspectives would have been welcomed. They concluded that they needed to build on this co-creation experience (interacting Ba) to further develop joined-up, integrated and collaborative working in their region.

Different aspects of Ba evolved throughout the process. Phases 2 and 3 enabled sharing, reflection, dialogue and active engagement with peers, supporting "more consciously constructed" interacting Ba (Nonaka and Konno 1998). Face-to-face interaction is considered a crucial aspect of innovation because it enables people to access each other's subjective views, shared meaning, purpose, experience, knowledge, and understanding. (Lawler and Bilson 2010; Davis and Smith 2012; Davis et al. 2011). It also allowed mental models to be collaboratively analysed and converted into common terms and concepts (e.g. each L&DEx project member possessed tacit positions on their own working values. The design thinking process (guided by facilitated discussion, visualisation and the DNA toolcard shown in Figure 2) enabled the formation and externalisation of key values for the forum to be collaboratively identified and made explicit.

In the social services sector, humanistic approaches (e.g. joint problem solving) enable service users and professionals to develop collective organisational structures and visions based on their diverse personal experiences within the field (Davis and Smith 2012; Lawler and Bilson 2010). Central to the formation of the L&DEx was mutual intelligence (thinking derived from groups) and exchange of tacit and explicit knowledge.

Innovative processes that encourage collective intelligence attract people to participate because they are welcoming, challenging, encouraging, rewarding and intrinsically motivating environments (Murty et al. 2010). Here, Ba breaks through barriers between participants and enables deeply human abilities such as sympathy, empathy and shared emotions. In this sense, Ba is similar to 'creative flow' that occurs when emotions are channelled and shared during interactive learning processes (Best and Thomas 2007; Corner 2012). Design thinking enables such sharing by nurturing an environment where judgement is reserved and respect, equity and diversity are encouraged and supported. This is guided by a flexible yet defined structure for co-creation (i.e. agenda activities with defined objectives, activity toolcards and expert facilitation) with a clear aim (in this case, the need for a new network).

Research has suggested that creativity and innovation are connected to abductive reasoning, intrinsic motivation and a collective aspiration to work out collaborative solutions (Davis et al. 2011). Supportive structures are considered to increase workers' freedom to interact with each

other. During the design thinking process for the L&DEx, a cross-section of local stakeholders voluntarily opted-in to the co-creation process, and the structure of the activities ensured a diversity of views was forthcoming, which was guided by expert facilitation and bespoke toolcards. Hence, we can conclude (in keeping with Etzioni 1993; Ibáñez et al. 2010), that design thinking helps develop the ideal social conditions for creativity and innovation when it enables people to be creative and innovative for the common good.

5.1.2 Design Thinking as a Cognitive/Epistemic Enabling Condition for Ba

Literature has highlighted the benefits of openness, diversity and equity for organisational innovation (Davis and Smith 2012). This approach can be connected to writing that assumes knowledge creation collaborators will value shared ideas as well as opposing views:

> "Our second group of enabling conditions – cognitive/epistemic, is related to common knowledge or shared epistemic values and commitments. It's a sine qua non condition the existence of shared beliefs and ideas, as well as people with different backgrounds and mental models, enabling a context where contradictions and diverging ideas are seen as positive issues, not as obstacles for knowledge creation and innovation." (Drummond de Alvarenga Neto and Choo 2010)

The qualitative evaluation of the L&DEx stakeholder engagement event (Docherty and Dowling 2012) found that participants greatly valued the opportunity to collaborate with others from different backgrounds and share their views, ideas and experiences in exploring the purpose and form of the new forum. When asked what worked well in the workshop, responses included:

> "Mixing/sharing with different disciplines within Social Work/voluntary sector." Participant_A9

> "Networking, Hearing other people's experiences and ideas, what's developing in other areas, encouraging innovative thinking." Participant_A11

In multi-professional children's services participative approaches are linked to appreciative communication, reflective analysis of differences/discordance, participatory/community decision-making and collaborative local forums/networks (Davis and Smith 2012; Glenny and Roaf 2008). Such approaches encourage community members, in this case forum members, to balance personal with collective goals; avoid interacting on the basis of ego; be willing to take risks; have

open minds; utilise personal attributes, be reflexive, actively listen, value diversity and go beyond traditional thinking (Davis and Smith 2012). Similarly, we can conclude in relation to what conditions best support innovation that design thinking helps to remove barriers to engagement (stimulates interacting Ba) by providing a supportive structure (e.g. an objective-focused agenda, toolcards to guide activities, visualised outputs (see Figure 2), and skilled facilitation to encourage participation and different viewpoints) that enables interaction between participants from across a range of disciplines and experiences. For example, the L&DEx design thinking process made no distinction between participants on the basis of discipline, position or seniority, all participants' contributions were given equal weight.

5.1.3 Design Thinking as an Informational Enabling Condition for Ba

Drummond de Alvarenga Neto and Choo (2010) argued that technological infrastructure (information technology, information systems and information management) is an enabling condition for Ba. During the design thinking process technological infrastructure (online resources such as project web sites, social media, email, and Dropbox) is used to allow participants access to information. This may be contextual in advance of an activity; during a project, to allow interim and evolving outputs and visualisations to be shared and evolved; and to disseminate the final outputs. The design thinking approach employed in the L&DEx enabled cyber Ba through appropriate access to information and wider engagement, including the use of email, telephone and the existing community of practice web site and resources.

The L&DEx demonstrates that access to information can be one of the ideal conditions for change. Real life spaces (e.g. meetings and workshops supporting originating, interacting and exercising Ba) enable participants to build significant relationships, develop new insights and exchange creative ideas. However, this is not always possible, and face-to-face interaction can be complemented through access to virtual spaces (Cyber Ba). Previous research found that IT could be used to support information, learning and knowledge sharing, particularly with international and remote collaborators (Davis et al. 2011). The L&DEx demonstrated that it was also effective for connecting participants in different locations (e.g. rural and urban) within the same region/country.

5.2 Structural Enabler: the Business/Managerial Enabling Condition for Ba

It has been argued that the enabling conditions for Ba include supportive: colleagues, cultures,

structures, inter-organisational processes and physical spaces (Drummond de Alvarenga Neto and Choo 2010). This particular group of enabling conditions is denoted in this paper as a structural enabler. It is proposed that this type of enabling condition differs from the three noted above as it is a fundamental and necessary condition to allow innovation to occur when change is informed through a multi-stakeholder, co-creative approach such as design thinking. To put it another way, it is proposed that a structural enabler in the form of appropriate organisational culture and management approach is a pre-requisite for co-created knowledge to lead to innovation.

The creation of a structural enabler may or may not be assisted by design thinking. In this case, design thinking is not a prerequisite for the existence of a structural enabler in the first instance as the SSSC leadership had already moved away from a paternalistic, top down operational approach and engaged participatory decision making. However, it was instrumental at the level of the L&DEx formation and operations. Indeed, it is anticipated that the co-created mission, governance and operational structure of the forum will provide an ideal long-term structural enabler that is suited to further implementation of the knowledge created during the design thinking process and will facilitate the ongoing sharing and creation of knowledge within its membership.

Humanistic concepts highlight the need for organisations to have systems that promote worker motivation; address power/participation tensions; question hierarchical working (e.g. top-down patronage); recognise the benefits of local consensual agreement; appreciate the effectiveness of dispersed leadership, promote bottom-up service development and associate leadership with subjectivity, context, story-telling and collective sense-making (Muldoon 2004; Lawler and Bilson 2010; Davis and Smith 2012).

Humanistic approaches have been critiqued for not challenging power relations throughout a system (Davis and Smith 2012). It is proposed that by enabling Ba and Basho, design thinking has the potential to overcome this critique by enabling spaces of creativity to be connected within a system in ways that allow different people to have the power to co-generate solutions. Collective sense making involves the idea that situations can be improved if participants' issues are analysed in terms of their different worldviews; if there are debates that compare different perspectives on a problem; and if that debate enables ideas to be adapted to take account of local perspectives (Checkland and Scholes 1990; Lawler and Bilson 2010).

This connects design thinking to writing on distributional justice that argues that innovation flourishes when power in organisations is shared between diverse people rather than invested in

one individual (Dahlberg et al. 2007; Lawler and Bilson 2010; Davis and Smith 2012) and to the notion that the ideal social relations for change do not always involve processes where we iron out difference and produce universal solutions. People have multiple identities across different contexts and public services should be open to community/cultural interpretation and critique (Young 1990; Davis and Smith 2012).

5. 3 Design Thinking, Ba and Enabling Conditions

The L&DEx case study provided a valuable lens to explore the connection between design thinking, Ba and its enabling conditions to support innovation.

Firstly, we propose that design thinking can be an effective stimulus for co-creating solutions to complex issues in areas of transition, such as social services. It supports Ba, spaces for knowledge creation, and enables engagement of multi-professionals by providing a flexible and supportive framework with goal-oriented activities and tools, rather than a laissez-faire approach that can hinder creativity and innovation (Davis et al. 2011; Davis and Smith 2012). Design thinking nurtures a non-judgemental, trusting space to allow divergent, intuitive and analytical thinking to find collaborative solutions for the common good.

Secondly, we propose that design thinking supports Ba by aligning with enabling conditions for knowledge creation. Two distinct types of enabling conditions for Ba are suggested: relational and structural. Design thinking activities connect well to relational enablers, supporting behaviour, format and information for knowledge creation. Where a structural enabler does not exist, design thinking can facilitate this process.

Thirdly, we propose that a suitable structural enabler (organisational and management culture) is vital if ideas are not be overlooked by the powerful and innovation is to be enabled. This resonates with the notions of shared leadership and power/distributional justice that enable innovation to flourish. Without a structural enabler design thinking activities can be viewed as tokenistic and new ideas wasted.

Organisational structures and operations may be facilitated by design thinking, but the intention to embrace a consensual managerial structure has to exist among the organisations' leaders if co-creative change is to be enabled. Indeed, Konno (2009) suggests that to embed knowledge creation an organisation requires a move away from quality management, where analytical approaches

predominate, to creativity management: a new style of leadership that recognises social and human dimensions, draws on multiple perspectives, synthesises diverse sources of information and practices intuitive visualisation. Building on this work, we conclude that for design thinking to have value and its outputs to support innovation, Ba must be supported by an appropriate organisational infrastructure.

6.0 CONCLUSION

This paper explored three key questions concerning design thinking, knowledge creation and innovation. A co-created network in social services provided a case study through which we explored the stages and mechanism leading to innovation.

We identified that design thinking enhanced both the formation of the L&DEx as an organisation and as an online resource for the sector by enabling co-creation and activating mental, physical and virtual Ba. Design thinking acted as a relational enabler across three groups of enabling conditions for knowledge creation: by providing a structured and nurturing framework that facilitated respectful creative interaction (social/behavioural enabler); by assisting diverse professionals to self-empower/commit to shared values (cognitive/epistemic enabler); and by utilising technology to facilitate the sharing of information, practices and resources (informational enabler).

For knowledge creation to lead to innovation, new ideas have to be implemented. We propose that for change to happen an appropriate structural enabler is required, i.e. an organisational culture and management approach that can support and be receptive to the behaviours, format and outputs of co-creation activities. Structural enablers may emanate from sources outside of the scope of design thinking or be assisted by it. Critically, without an appropriate structural enabler it is unlikely that the full liberational possibilities of co-creative processes will come to fruition. We conclude that the ideal conditions for change require that a balance be struck between an organisational culture that encourages input from outside of the traditional power structure and an organisational/management framework that supports meaningful, co-creative activity.

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